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Breaking the Digital Divide in Rural Africa

Completed Research Full Papers

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Abstract

Telecenters are considered to be invaluable in reducing the digital divide between cities and villages. In most developing countries, once telecenters are well organized and functional, and when awareness-raising on the merits of telecenters is well established, it is expected that people will embrace and integrate them into everyday practices and habits. This qualitative study, adopting mixed research method, explores the adoption of Multipurpose Community Telecenters in rural areas of Cameroon. The focus of the study is to highlight the digitalization needs of marginalized communities. The results suggest that several target groups never had access to the Internet, and some have never used an ICT tool. This study thus attempts to propose an extension of the UTAUT model with Cameroonian factors of influence such as Culture and Language. We adopted a mixed research method to contribute to the extant literature on telecenters in Africa, highlighting their impact on rural communities.

Keywords

Digital Divide, Rural Communities, Telecenters, UTAUT

Introduction

For more than a decade, there has been an exponential growth in the use of ICT in the economic and social life of African countries. The implementation of ICT solutions to break the "digital divide", fight extreme poverty and promote social development in developing countries have become the leitmotif of governments, international donation agencies, and NGOs (Ali 2007; Hidalgo et al. 2020). The deployment of ICT infrastructures and services is aligned with the aim of promoting the multi-sectoral development of localities that have been slow to reach the digital world. As shown in the Internet World Stats chart, internet users in the African continent represented only 11% in June 2018. The 2015 annual report of the International Telecommunication Union (ITU) reinforced this assertion in view of Africa's position in the global digital chessboard. It states that only 10.7% of African households had internet access compared to 34% of households in developing countries. This statistic shows that the internet has become a driver of development index and that Africa is lagging in comparison with what is happening elsewhere, despite the potential and resources it has. Thus, we note that the weak access to the internet and digital services in the continent and precisely in the developing countries is mainly limited to urban areas, thus demonstrating a digital split between rural and urban areas (Alemneh and Hastings 2006; Estacio et al. 2019). For sustainable and efficient development of communities in developing countries, access to digital services, particularly e-government is of vital importance. There is a consensus among practitioners and researchers that governments should work towards providing digital public service access to their citizens. Digital services are found to help in tackling bad governance and corruption as e-governance facilitates efficiency and transparency in the management of public affairs, and fosters participation of citizens in the decision-making processes (DESA 2017).

Multipurpose Community Telecenters (MCT), facilities that provide basic digital services to the marginalized populations, have emerged to address the issues of the digital divide in the developing countries. These centers serve as physical spaces that provide people with a variety of digital services to improve, for instance, their education and promote economic and social development (Gómez and Reilly 2002). Telecenters are digital hubs, designed for non-profit purposes, and precursors of digitalization in remote areas to significantly reduce the digital divide and provide information for poor communities.

Chege et al. (2019) found that telecenters also serve as centers of attraction for communities sharing the same interests and the same ideology in the sense that they bring together local actors who wish to share their ideas and develop their technological potentials. They are found mainly in rural areas as well as in remote communities in large cities, where access to information and telecommunication tools is limited or non-existent (Furuholt and Sæbø 2018). Telecenters can also be found in the poor neighborhoods of large cities that are comparable to rural areas. In developing countries like Cameroon, telecenters are associated with a series of projects and reforms set up by the German cooperation and government reform programs aimed at breaking the digital divide.

The desire of the Cameroonian government to reduce the digital divide has yet to be realized since the launch of Multipurpose Community Telecenters (MCT) in Cameroon in 2003. Several reasons have been brought up. For instance, obsolescence of existing equipment, recorded burglary cases, and electrical energy problems in several localities have prevented the proper functioning of these telecenters. Given these shortcomings observed, the German Agency for International Cooperation GmbH (GIZ), under the Support Program for Municipal Development (PROMUD) will provide, as part of a pilot phase, its support to 4 telecenters located in north Cameroon (Bibémi and Mandama) and south Cameroon (Idenau and Bakingili) with its impact expected on the whole national territory. This support will consist of the introduction of new digital services based on needs analysis, the testing of new management models, in support of the provision of Internet access in and out of the telecenters. They will also support the revitalization of at least one management committee while building the capacity of the telecentere staff.

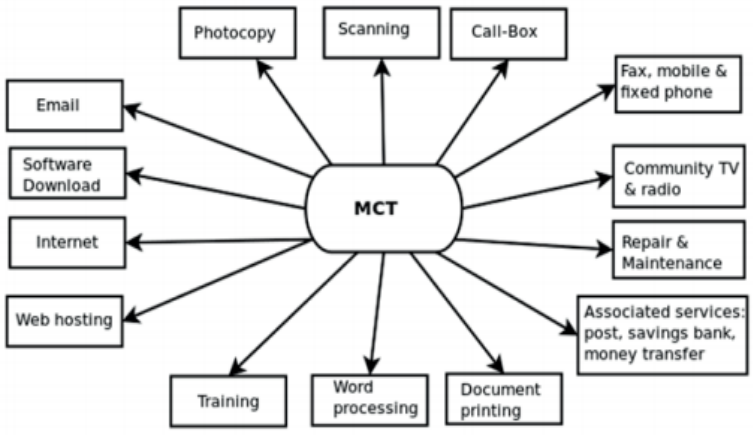

Figure 1: Overview of actual services offered by MCT in Cameroon

This study aims to fill the knowledge deficit observed in the existing literature on MCTs in Africa by developing an extension of the UTAUT model, taking into account Cameroonian factors such as culture and language, the costs of services provided by the telecenters, and problems related to electricity. We draw on the literature on Multipurpose Community Telecenters in Africa, as well as studies on methods and techniques for adopting telecenters in rural areas to better achieve our research objective.

The remainder of the paper is structured as follows: the next section presents the theoretical and conceptual framework as well as the research hypotheses. The subsequent part describes the research methodology, highlighting the approach chosen to carry out this study. The following section presents the results of the qualitative study, highlighting the particularity of several target groups encountered. The qualitative study carried out, therefore, represents an important basis that will allow us to conduct the quantitative study. In the end, the expected results and the various implications will be briefly discussed.

Conceptual Model and Hypotheses

In this section, we highlight the research model designed for the study and the development of our hypotheses. This model, an extension of the UTAUT model, introduces various factors related to the context and the study environment (Furuholt and Sæbø 2018). Thus the UTAUT model constructs as specified in the works of Venkatesh et al. (2003) are listed as follows: performance expectancy, effort expectancy, social influence and facilitating conditions, and anxiety. The role of key constructs, such as

management effectiveness and program effectiveness are crucial in the process of adopting telecenter usage by users.

Core constructs

Performance Expectancy: refers to "*the degree an individual user believes that using the Telecenter will assist in enhancing his/her performance*" (Venkatesh et al. 2003). This construct is recognized to have an influence on all the constructs of the UTAUT model with respect to behavioral prediction. According to Kapondera and Hart (2016), performance expectancy has a positive influence on the behavioral intention to use any computer technology. Wang and Shih (2009) also found that performance expectancy was a major factor in the adoption of telecenters. The acclimatization of performance expectancy for telecenters implies that people find telecenter services necessary for better navigation in activities, quick and easy access to information, and better collaboration between local actors. So, the following hypothesis is suggested:

H1: Performance Expectancy positively influences Behavioral Intention to Use Telecenter (BIU).

Effort Expectancy: refers to the level of facility in using telecenter services (Venkatesh et al. 2003). It has been found that in studies adopting the UTAUT model, for instance, effort expectancy has a significantly positive influence on the intention to adopt and use a computer system (Patel et al.). In the context of telecenters, individual acceptance in the use of telecenters is underlying the ease of use of telecenter services. We, therefore, suggest the following hypothesis:

H2: Effort Expectancy positively influences BIU.

Social Influence: refers to the extent an individual perceives others who are essential to approve his or her use of the telecenter (Venkatesh et al. 2003). It is reported that social influence determines the formation of individuals' intention to use information and communication technologies.

H3: Social Influence has a positive influence on BIU.

Anxiety: the anxiety about the use of any technology is explained as the appearance of a feeling of fright, an emotion of distress when it comes to exercising an action (e.g., use IT tools) (Compeau and Higgins 1995; Venkatesh et al. 2003).

H4: Anxiety has a positive influence on BIU.

Management Effectiveness: refers to the specifications related to the resolution of organizational problems and actions concerning staff management within the Telecenter (Balduck and Buelens 2008). Aspects such as management processes, operating structures, and all the activities that drive the telecenter are taken into account (Quinn and Rohrbaugh 1983). This construct is derived from the CVA theory (Quinn and Rohrbaugh 1983).

H5: Management Effectiveness has a positive influence on BIU.

Program Effectiveness: refers to specific programs and activities that the telecenter will provide as it is set up with the aim of providing a certain number of digital services to rural communities (Sowa et al. 2004).

H6: Program Effectiveness has a positive influence on BIU.

Facilitating Conditions: Facilitating Conditions is defined as the firm conviction that any user has over the existence of technical supervision in charge of supporting the operation of the telecenter (Venkatesh et al. 2003).

H7: Facilitating Conditions positively influence BIU.

Cameroonian Factors Used to Customize UTAUT Model

The contextual factors are related to the specificity of the study environment as well as various development indicators of the study area. These factors, therefore, contextualize the theories and models applied in the context of this study.

Awareness: It is defined as the ability to be informed about the use of a new service/product, a concept that could be beneficial in carrying out the daily tasks of a community. In Cameroon, the issue of awareness in relation to telecenters is important because this is still a new concept, and there is a need to raise awareness. Activities and awareness-raising campaigns on the use of ICT tools in general and the promotion of telecenters are organized by the Support Program for Municipal Development (PROMUD) of the German Cooperation. These campaigns aim, in addition to raising awareness, to provide rural populations with the skills and competencies they need to be able to use the ICT tools, as well as the digital services that will be deployed in the telecenters.

H8: Awareness has a positive impact on BIU.

Culture/Language: There are more than a hundred traditional kingdoms in Cameroon, with more than 250 vernacular languages throughout the country. English and French are the official languages of the country. However, young people have created a complex form of slang called "camfranglais" (mixture of French, English, vernacular Cameroonian phrases, and even verlan) that varies between cities (Ngefac 2008; Rogozinski and Biggs 1903; Vakunta 2008). Some also use the "Pijin", which is a mixture of English and slang (Vakunta 2018). Therefore, we suggest that:

H9: Culture positively impacts BIU.

Cost: It represents the charge of the telecenter's services to the users regarding the expenditure made. The cost should be relatively low given the economic situation in rural areas.

H10: Cost has a positive impact on BIU.

Power Supply: The problem of energy production in Cameroon is at the center of investments. This is one of the government's primary concerns, that of being able to supply electrical energy to all towns and villages of Cameroon (Diboma and Tatietse 2013; Nfah and Ngundam 2009).

H11: Power Supply has a positive impact on BIU.

Legal/ Government regulations: the Cameroonian government has set up several regulations on the management and use of telecenters through the Ministry of Posts and Telecommunications (Hallberg et al. 2012).

H12: Legal/ Government regulations have positive impact on BIU.

Accessibility: defined as the availability of necessary IT tools for the operation of telecenters for particular users (Lwoga and Chigona 2019).

H13: Accessibility has a positive influence on BIU.

Trust/Security: refers to the intention to be voluntarily vulnerable to the actions of other users (Mayer et al. 1995).

H14: Trust has positive impact on BIU.

Reliability: refers to the feeling possessed by individuals with regard to the ability of the telecenter to perform all the missions assigned to it without failing (Rao and Iyer 2016).

H15: Reliability positively influences BIU.

Control variables

H16: Control variables (**age, gender, experience, income, Education**) have positive impact to moderate core constructs (performance expectancy, effort expectancy, social influence, anxiety, management effectiveness, program effectiveness, facilitating conditions) on BIU.

H17: Control variables (**age, gender, experience, income, Education**) have positive impact to moderate core constructs (performance expectancy, effort expectancy, social influence, anxiety, management effectiveness, program effectiveness, facilitating conditions) on Cameroonian Factors (awareness, culture, cost, power supply, government regulatory, accessibility, trust, Reliability).

Behavioral Intention to Use Telecenter: refers to the level of the intention to manifest a specific attitude regarding the intention to use telecenter services (Ajzen 1991).

H18: Behavioral Intention to Use Telecenter has a positive effect on Telecenter User Acceptance.

Telecenter User Acceptance: is concerned with the acceptance of the individual use of the Telecenter by users.

H19: Telecenter User Acceptance has a positive impact on telecenter value creation

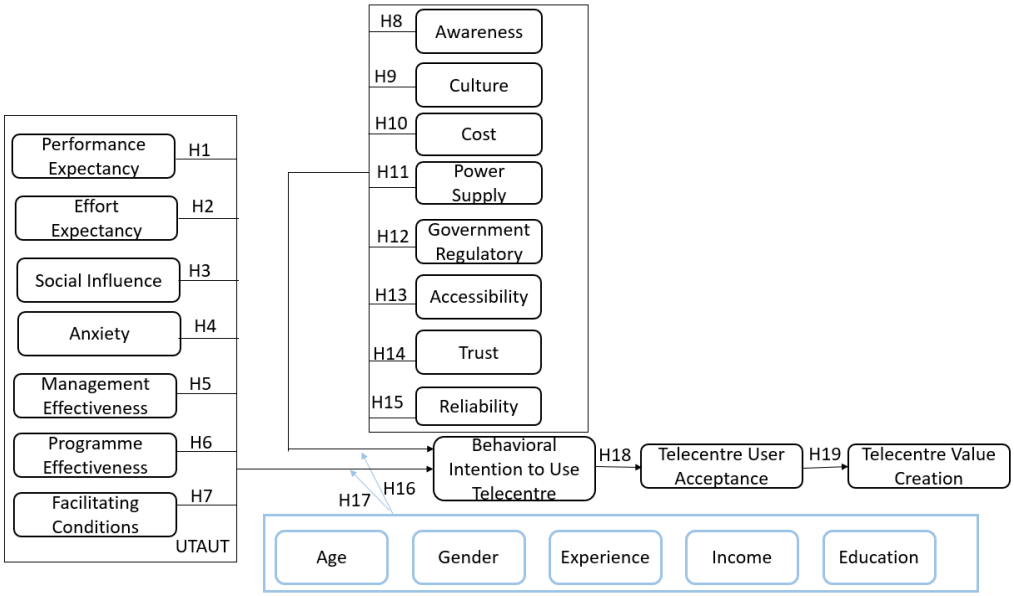

Figure 2: Research Model

Methodology

This study adopts a mixed research method for testing and analyzing the proposed research (Schoonenboom et al. 2018). It's a method based on quantitative and qualitative modeling developed in the same research study to mitigate the deficiencies of both methods (Caruth 2013; Kelle 2018). The mixed methods research is thus a research protocol based on a mixture of philosophical and theoretical hypotheses, quantitative and qualitative research approaches (Johnson and Onwuegbuzie 2004). It requires an intelligent and relevant assembly of information collection (data) approaches, analysis of this information, and interpretation for better decision-making (Creswell and Clark 2017). The study begins with a qualitative research to better interpret, understand, and justify the results we obtain in the quantitative section. The study will be conducted in rural areas in Cameroon, specifically areas where Telecenters are located. For a solid foundation, we started with interviews to gather different opinions on the role that telecenters play for the community as well in order to assess the real impact on the daily activities of citizens. We interviewed various target groups and different stakeholders where the need for digital services is highly demanded, and the poverty line is very high, according to the World Bank (Christiaensen and Todo 2013; Wodon and Blackden 2006). We will then proceed with a quantitative analysis that involves the development of a research questionnaire using a Likert scale graduated from 1 to 7 (Ogden and Lo 2011; Sullivan and Artino 2013). The survey questionnaire will be distributed to rural and marginalized communities from landlocked areas, far from cities, which only have the Telecenter as a digital hub and center of attraction and technological development. We plan to collect at least 500 questionnaires for better analysis, which reflects the current situation. The next step will be devoted to the pre-test phase, the implementation of a pilot study, and the validation of the scale to improve our measuring instruments.

Results

A qualitative study as the needs-gathering study was conducted by the German consulting firm AMBERO-Zebralog in the North and South-West Cameroon. The purpose of this study was to gather the needs of the communities where the telecenters are located in the field of digitalization and municipalities' digital

services. In South West Cameroon, a total of 100 people participated in the needs analysis workshops in Idenau and Bakingili. In the municipal workshop, 16 participants were present as representatives of the council, municipal staff, and the mayor. The eight focus groups counted 84 participants in total, 52 in Idenau, and 32 in Bakingili. The focus group participants represent the following groups: youth, teachers (civil servants), Okada/moto taxi drivers, businessmen, traditional village councilors, telecenter staff, women cooperative, forestry Cooperative, and farmers. In the municipal workshop, the highest priority was given to the development of a municipal website in order to satisfy a large number of specific information needs. While many needs are similar in Idenau and Bakingili, there are also differences in priorities. In the North region of Cameroon, three combined workshops of mayors and their collaborators had been held. With 44 participants, these workshops allowed Mayors and their collaborators to make an inventory of the services that the council is rendering to its community and to itself. The eight focus groups counted 141 participants in total, 29 in Bibémi, 51 in Garoua II, and 61 in Mayo-Oulo. The focus group participants represent the following groups: youth, women, students, teachers, moto taxi drivers, merchants, and farmers.

Table 1. Preliminary findings from the telecenter project (AMBERO-Zebralog Study)

Needs	**Ideas (for digitalization)**	**Who raised this need?**
	Taxes, payments, finances	
Making payment of taxes and bills easier and more transparent; Establishing a system for transparency of revenues and expenditures; Education of the community on the importance of taxes	• Payment of taxes and bills via Internet • Digitize the taxpayer file by sector of activity • Visualizing tax assessment criteria and categories online • Budget transparency online	Teachers, Okada drivers, businessmen, Bakingili traditional council, Bakingili Progressive Women Cooperative, Idenau Council, Youth
	Participation in municipal decision-making	
Involving citizens in communal planning	• Opinion polls on projects of the mayor's annual development plan • Participation in the selection of types of projects to be implemented (community consultations) • Asking questions to the mayor	Idenau Council, Youth, Okada drivers, businessmen, Bibémi municipal staff, Bibémi Youth, Bibémi farmers & merchants, Garoua II municipal staff;
	Business opportunities	
Facilitating the search for Jobs; Providing new job perspectives and business opportunities	• Publishing job advertisements online • Selling of products online • Electronic repair shops	Youth Bakingili youth and telecenter staff Bakingili Community Forestry Management Cooperative; Okada drivers, businessmen; teachers
	Tourism and social services	
Promoting attractive sites in the community (beaches, touristic sites etc.), Facilitating social activities in the community	• Geolocalization of touristic sites • Promotion of interquarter football competitions and social entertainment online	Idenau Council, Bakingili Community Forestry Management Cooperative
	Administrative services	
Improving efficiency of administrative services	• Digitalizing birth certificates • Online building permit acquisition	Idenau Council, Teachers

Needs	Ideas (for digitalization)	Who raised this need?
Education and culture		
Facilitating the documentation and archiving of information, Improving access to higher education	• Digital archiving of documents for teachers and students • Promotion of online higher education	Youth, Teachers, Bakingili youth and telecenter staff
Health and safety / emergencies and crime		
Improving access to medical (emergency) aid Improving security of maritime staff Improving communication in case of accidents or crime Improving security for farmers	• Quick medical attention by a doctor via Internet (in the night, remotely) • Geolocalization of water access points • Locating maritime service staff in case of challenges at sea (geolocalisation) • Online reporting of incidents like accidents, lost items, theft • Online communication about stray animals destroying crops	Teachers, Bibémi municipal staff, Bibémi Youth, Bibémi farmers & merchants, Garoua II municipal staff, Bakingili Progressive, Women Cooperative, Bakingili Community Forestry, Management Cooperative, Bakingili Multipurpose, Farming Group

For many participants, both in the North and in the South West, financial transactions with the municipalities of any kind could be benefitting from the use of digital tools in the telecenters, especially as services such as mobile money are widespread and known by the local population. Participants suggest mobile payment for all kinds of contributions, fees, and eventually, taxes. Therefore, they see the need for a database of taxpayers and electronic handling of the entire taxing process: from the registration as a taxpayer to the reminders sent out to those who delay their payment, from paying taxes online to getting certificates. Especially the latter is relevant, as different participant groups (such as merchants, farmers, vendors, moto-taxi-drivers) in both regions report incidents of an attempted scam, where participants got threatened by fraudulent people pretending to collect taxes. Concerning the municipal budget, transparency is desired strongly by some participants, and others do not voice vocal opinions.

The ideas on how to improve citizen participation in municipal decision-making vary from region to region. While the idea of participatory budgeting is more popular in the North and linked to ideas such as SMS-based voting of parts of the municipal budget, the participants from the South West see other ways of involvement as more suitable. They see online pools and community consultations on a variety of topics as a good means to include also marginalized groups in local planning.

Also, business owners and those might want to start a business hope for easier processes with the help of digital services. This includes a digital process for signing up a new business (registration, mobile payment), fair distribution of financial aids and subsidies (especially to farmers), a digital municipal job markets (online job postings), more e-marketing of local business and a focal point of digital information for specific sectors such as where to get access to improved seeds, phytosanitary products or production skills.

The variety of ideas in the realm of education and culture is smaller compared to other areas and concentrates mainly on one idea (especially in the North): a municipal digital library. This library could not only provide access to e-books, newspapers, and encyclopedias such as Wikipedia but could also offer digital learning material such as schoolbooks and exercises. Other ideas related to education include the digital archiving of school documents or a digital job application procedure for teachers.

Participants in both regions are faced with challenges that concern health, sanitation and hygiene, public safety, and crime. Main ideas want to tackle problems that are particularly pertinent in rural areas: how to

prevent, signal and react to disasters such as epidemics (e.g., cholera outbreaks), kidnappings of animals and children (especially in the regions bordering Nigeria and Tchad), maritime distress, stray animals destroying farmers' crops, road accidents, lost items, theft or the lack of a doctor nearby when quick medical attention is needed. As ideas, SMS-based alert systems, geolocalization tools for difficult situations, surveillance cameras on markets, or telemedicine services are being discussed by the participants.

Internet access and use in the North and South West region

From the Zebralog-AMBERO needs analysis study, what is most striking in the results of the workshops in the North is the low rates of internet use. Overall, 60% of the focus group participants stated that they never use the Internet. These results are even more drastic in the community of Mayo-Oulo, where over 65% of participants are non-users of the Internet. In Mayo-Oulo, internet use was lowest in the groups of students and farmers (85,7% each), followed by merchants (66,7%). Only the teachers have more regular internet use (33,3%). These numbers indicate quite clearly that the introduction of digital services will require a considerable amount of sensitization and training. From the perspective of citizens, given that many do not even have access to Internet, most of them would not formulate digitalization as a pressing need– but rather as a 'nice to have', coming after needs in the area of connectivity and infrastructure. In the South West Region, out of the 16 participants in the municipal workshop, 13 and thereby the large majority said that they never use the Internet for work, and only three said that they sometimes or regularly use it. The focus group participants ranged widely from no Internet use at all to regular Internet use. However, compared to participants in Idenau, participants in Bakingili use the Internet much less. About 65% of the Bakingili participants never use the Internet.

Looking at the participants' preferences regarding the tools to access future digital services, the telecenters still represent an important access point. 47,8% of the overall participants prefer accessing services from there. This need for the telecenter is even stronger in Mayo-Oulo, where students (47,1%) and teachers (100%) want to rely on this physical space in the municipality. As Mayo-Oulo is the municipality that is the most rural and, thus, the most difficult to access, we might see a link between "isolation" of a community and its levels of digitalization. For example, the farmers and especially the merchants, both in Garoua II (71,4% of merchants) and Mayo-Oulo (66,7% of merchants and 27,8% of farmers), prefer service access with smartphones and messenger services such as WhatsApp. One might also conclude that participants in more urban areas such as Garoua II are more often equipped with smartphones than in rural areas. Regarding preferences in terms of access, the focus group participants want to access future digital municipal services, preferably through the telecenter (43%) or a computer / Website (32%). Looking at differences between Idenau and Bakingili, the huge majority in Bakingili (90%) wants to access municipal services via the telecenter. In Idenau, only 13% of participants chose the telecenter as a preference, but 50% in Idenau prefer access via computer/website. Regarding communication via phone, participants prefer SMS (14%) over smartphone apps (6%); in Bakingili no one wishes to access the services via smartphone.

Outlook

The realization of this project will provide rural communities with digital services and information in local languages, thus promoting a better understanding of the services offered and full adoption and use of telecenters. Previous work done in Uganda by Ninsiima (2015) reported that more than 80% of the study participants were totally unanimous that the system was easy to use as 63% felt the system was easy to learn. Regarding the analyzes, it was found that the ease of learning to use the computer system was related to the fact that all the services and information offered by the system were in the local language. Although Cameroon is a bilingual country, the mastery of French and English in rural areas is relatively low. This may also be due to the low school enrollment rate in rural areas. Thus, the adoption of new technologies in rural areas inevitably passes by the provision of digital services and information in the local language. In many developing countries in Africa, foreign languages such as English and French are established as official languages, which promotes the understanding of information to be conveyed by a minority of people. The necessary information to be distributed in the hinterland for the benefit of farmers, fishermen, those who are under-educated, and out-of-school remains unused, and economic and social development is lagging. They need to feel comfortable using ICTs because they are adapted to their

environment, responding to a specific real need observed. As suggested by Tenhunen (2008), when a system is made available in a rural area according to the previously studied characters and habits of this area, it promotes familiarity with system use and, therefore, a good performance in the understanding of the information conveyed by this system. This study, therefore, fits into this logic of being able to raise the rate of use of digital technologies by offering rural populations a range of digital services adapted to their daily needs according to their local languages.

This paper aimed to contribute to the extant literature on the role and impact of Telecenters in improving the living conditions of rural communities in developing countries. To reach our objectives, the use of a mixed research method allows a better enrichment of the existing literature, and a better insight into the results obtained. Our research model extended the UTAUT model by incorporating factors related to the context of the study, such as culture/language, or the energetic environment of target communities. With the will of the Cameroonian government to give some fresh air to the telecenters as well as the support of the German cooperation, telecenters will serve as a point of digital attraction for all communities far from the large cities.

References

Ajzen, I. 1991. "The Theory of Planned Behavior," *Organizational Behavior and Human Decision Processes* (50:2), pp. 179-211.

Alemneh, D. G., and Hastings, S. K. 2006. "Developing the Ict Infrastructure for Africa: Overview of Barriers to Harnessing the Full Power of the Internet," *Journal of Education for Library and Information Science* (47:1), pp. 4-16.

Ali, M. 2007. "The Challenge of "Sustainability" in ICT4D–Is Bricolage the Answer?," in *Proceedings of the 9th international conference on social implications of computers in developing countries,* São Paulo, pp. 54-60.

Balduck, A.-L., and Buelens, M. 2008. "A Two-Level Competing Values Framework to Measuring Nonprofit Organizational Effectiveness," *Vlerick Leuven Gent Working Paper Series (19*), pp. 1-29.

Caruth, G. 2013. "Demystifying Mixed Methods Research Design: A Review of the Literature," *Mevlana International Journal of Education* (3), pp. 112-122.

Chege, C. W., Kiplang'at, J., and Rotich, D. C. 2019. "Information Services Provided by Maarifa Telecenters to Rural Communities in Asals in Kenya," *Inkanyiso* (11:1), pp. 50-68.

Christiaensen, L., and Todo, Y. 2013. *Poverty Reduction During the Rural-Urban Transformation-the Role of the Missing Middle*. New York: The World Bank.

Compeau, D. R., and Higgins, C. A. 1995. "Application of Social Cognitive Theory to Training for Computer Skills," *Information Systems Research* (6:2), pp. 118-143.

Creswell, J. W., and Clark, V. L. P. 2017. *Designing and Conducting Mixed Methods Research*. OH: Sage publications.

Diboma, B. S., and Tatietse, T. T. 2013. "Power Interruption Costs to Industries in Cameroon," *Energy Policy* (62), pp. 582-592.

DESA, U. N. 2017. *United Nations E-Government Survey 2016, New York: United Nations*.

Estacio, E. V., Whittle, R., and Protheroe, J. J. J. o. h. p. 2019. "The Digital Divide: Examining Socio-Demographic Factors Associated with Health Literacy, Access and Use of Internet to Seek Health Information," *Journal of Health Psychology* (24:12), pp. 1668-1675.

Furuholt, B., and Sæbø, Ø. 2018. "The Role Telecenters Play in Providing E-Government Services in Rural Areas: A Longitudinal Study of Internet Access and E-Government Services in Tanzania," *The Electronic Journal of Information Systems in Developing Countries* (84:1), pp. 1668-1675.

GÓmez, R., and Reilly, K. 2002. "Comparing Approaches: Telecenter Evaluation Experiences in Asia and Latin America," *The International Information & Library Review* (34:1), pp. 57-78.

Hallberg, D., Godem, C., and Dzimey, W. 2012. "Telecenter Approaches in Cameroon and Kenya Illuminated Using Behavioural Archaeology: Section I: Themes and Approaches to Inform E-Strategies," *The African Journal of Information and Communication* (2012:12), pp. 48-64.

Hidalgo, A., Gabaly, S., Morales-Alonso, G., and Urueña, A. 2020. "The Digital Divide in Light of Sustainable Development: An Approach through Advanced Machine Learning Techniques," *Technological Forecasting and Social Change* (150), p. 119754.

Johnson, R. B., and Onwuegbuzie, A. J. 2004. "Mixed Methods Research: A Research Paradigm Whose Time Has Come," *Educational Researcher* (33:7), pp. 14-26.

Kapondera, S. K., and Hart, G. 2016. "The Use of Multipurpose Community Telecenters and Their Services in Malawi: The Case of Lupaso Community Telecenter," *South African Journal of Libraries and Information Science* (82:1), pp. 13-25.

Kelle, U. 2018. ""Mixed Methods" in Evaluation Research-Working with the Opportunities and Boundaries of Quantitative and Qualitative Methods," *Zeitschrift Fur Evaluation* (17:1), pp. 25-52.

Lwoga, E. T., and Chigona, W. 2019. "Perception, Usage and Barriers Towards the Utilisation of the Telecenter among Rural Women in Tanzania," *Journal of Information, Communication and Ethics in Society* (17:1), pp. 2-16.

Mayer, R. C., Davis, J. H., and Schoorman, F. D. 1995. "An Integrative Model of Organizational Trust," *The Academy of Management Review* (20:3), pp. 709-734.

Nfah, E. M., and Ngundam, J. M. 2009. "Feasibility of Pico-Hydro and Photovoltaic Hybrid Power Systems for Remote Villages in Cameroon," *Renewable Energy* (34:6), pp. 1445-1450.

Ngefac, A. 2008. "The Social Stratification of English in Cameroon," *World Englishes* (27:3-4), pp. 407-418.

Ogden, J., and Lo, J. 2011. "How Meaningful Are Data from Likert Scales? An Evaluation of How Ratings Are Made and the Role of the Response Shift in the Socially Disadvantaged," *Journal of Health Psychology* (17:3), pp. 350-361.

Patel, N. M., Kadyamatimba, A., and Madzvamuse, S. 2018. "E-Learning Adoption in Rural-Based Higher Education Institutions in South Africa," in *Proceedings of the 2018 Conference on Open Innovation,*IEEE, Johannesberg, pp. 320-324.

Quinn, R. E., and Rohrbaugh, J. 1983. "A Spatial Model of Effectiveness Criteria: Towards a Competing Values Approach to Organizational Analysis," *Management Science* (29:3), pp. 363-377.

Rao, R. N., and Iyer, L. 2016. "Education as a Determinant of E-Governance Adoption: A Case Study of Telecenters of Karnataka," *Imperial Journal of Interdisciplinary Research (IJIR)* (2:13), pp. 32-38.

Rogozinski, S., and Biggs, M. A. 1903. "Characteristic Features of the Bantu Dialect "Bakwiri" Used in the Cameroon Mountainscompared with Some Other Related Dialects," *African Affairs* (2:8), pp. 400-415.

Schoonenboom, J., Johnson, R. B., and Froehlich, D. E. 2018. "Combining Multiple Purposes of Mixing within a Mixed Methods Research Design," *International Journal of Multiple Research Approaches* (10:1), pp. 271-282.

Sowa, J. E., Selden, S. C., and Sandfort, J. R. 2004. "No Longer Unmeasurable? A Multidimensional Integrated Model of Nonprofit Organizational Effectiveness," *Nonprofit and Voluntary Sector Quarterly* (33:4), pp. 711-728.

Sullivan, G. M., and Artino, A. R., Jr. 2013. "Analyzing and Interpreting Data from Likert-Type Scales," *Journal of Graduate Medical Education* (5:4), pp. 541-542.

Vakunta, P. 2008. "On Translating Camfranglais and Other Camerounismes," *Meta* (53:4), pp. 942-947.

Vakunta, P. W. 2018. "The Status of Pidgin English in the Cameroonian Tower of Babel: An Overview of the Linguistic Landscape of Cameroon Which Calls for the Recognition of Cameroonian Pidgin English as an Official Language," *English Today* (34:1), pp. 20-25.

Venkatesh, V., G Morris, M., B Davis, G., and Davis, F. 2003. "User Acceptance of Information Technology: Toward a Unified View," *MIS Quarterly* (27), pp. 425-478.

Wang, Y.-S., and Shih, Y.-W. 2009. "Why Do People Use Information Kiosks? A Validation of the Unified Theory of Acceptance and Use of Technology," *Government Information Quarterly* (26:1), pp. 158-165.

Wodon, Q., and Blackden, C. M. 2006. *Gender, Time Use, and Poverty in Sub-Saharan Africa*. New York: The World Bank.